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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,233	10/20/2003	Kia Seng Low	02 P 15173 US / INTECH	4063
48154	7590	05/02/2005	3.	
SLATER & MATSIL LLP 17950 PRESTON ROAD SUITE 1000 DALLAS, TX 75252			EXAMINER SARKAR, ASOK K	
			ART UNIT	PAPER NUMBER
			2891	

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/689,233	LOW ET AL.	
	Examiner	Art Unit	
	Asok K. Sarkar	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 17-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9, 11, 14 and 16 is/are rejected.
- 7) ☒ Claim(s) 5, 10, 12, 13 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species I claims 1 – 16 in the reply filed on April 15, 2005 and after interview of April 26, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 17 – 52 were withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group and Species claims, there being no allowable generic or linking claim. Election was treated as being made **without** traverse in the reply filed on April 15, 2005 and after interview of April 26, 2005.

Drawings

3. The drawings are objected to because Fig. 9B should be labeled as Fig. 10. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application

must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 1 – 3, 5 – 7, 9 – 11 and 13 – 15 are objected to because of the following informalities: In claims 1 – 3, 5, 6, 9 – 11, 13 and 14, the phrase "further dielectric" should be replaced with "special dielectric" or other similar terms. Several different dielectrics are used in the claim languages and the claims will more clearly understandable if they are numbered serially or sequentially. In claims 1 and 9, the phrase "said lower withstand temperature" is lacking proper antecedent basis. In claim 7, the phrase "said said lower withstand temperature" is misleading. In claim 15, the phrase "said another" lacks proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 – 3, 7 – 9, 11 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Seta, US 2002/0102843.

Regarding claims 1 and 9, Seta teaches a method of incorporating a dielectric

material into a semiconductor device, said method comprising:

- fabricating said semiconductor device/insulator structure with the conductive line 119 at least up to the thermal processing step using a dielectric material 121 having a maximum withstand temperature greater than the temperature of the thermal processing step;
- removing at least a portion of said the dielectric material; and
- depositing a layer of lower withstand temperature dielectric material 116 in place of the removed portion of the dielectric material with reference to Figs. 31 A and 31B in paragraphs 19 – 23. The dielectric TEOS oxide has a higher melting temperature than the dielectric 116 made of organic silicon oxide film and has inherently has lower withstand temperature than that of the TEOS oxide.

Regarding claims 2 and 11, Seta teaches lower withstand temperature dielectric material has a lower dielectric constant than the dielectric material in paragraph 292.

Regarding claim 3, Seta teaches the dielectric material 121 includes a portion that is disposed adjacent to at least one conductive line 119 of the semiconductor device with respect to Fig. 31A.

Regarding claim 7, Seta teaches planarizing lower withstand temperature dielectric material to a top surface of the conductive line and depositing a further layer of said lower withstand temperature dielectric material atop said layer of said lower withstand temperature dielectric material and atop said conductive line with reference to Fig. 34A.

Regarding claims 8 and 16, Seta teaches the step of depositing a layer of lower

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withstand temperature dielectric material 116 includes depositing said layer atop the conductive line 110, the method includes planarizing layer of the lower withstand temperature dielectric material such that a portion remains atop the conductive line 110 and serves as an inter-level dielectric layer with reference to Fig. 32F in paragraphs 333 – 342.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 4, 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seta, US 2002/0102843.

Regarding claim 4. Seta teaches using contact barrier layer in paragraph 293 and annealing of the barrier layer is conventional for the benefit of making the layer pinholes free for providing proper barrier function.

Regarding claims 6 and 14, Seta fails to teach a timed etching step for the dielectric material.

However, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify the etching step by applying a timed etching to stop the etching at a time when the etching reaches the conductive plugs.

Allowable Subject Matter

11. Claims 5, 10, 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

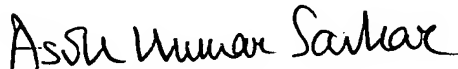
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Asok K. Sarkar
April 27, 2005

Primary Examiner